



math

works

$$\cos^{-1} \theta \sqrt{a^2 + b^2} e^{i\theta}$$

$$\Delta y \partial^2 \Omega \sin^{-1} \theta$$

All Students Need Advanced Math


To thrive in today's world, all students will need to graduate with very strong math skills. That can only mean one thing: Advanced math courses are now essential courses.

Advanced math equals college success.

- Over the past two decades, the percentage of tenth graders who plan to earn a bachelor's degree soared from 40 to nearly 80 percent.¹ Students have it right: Nearly two-thirds of the 30 fastest growing jobs in the U.S. will require a college degree.²
- Completing advanced math courses in high school has a greater influence on whether students will graduate from college than any other factor—including family background. Students who take math beyond Algebra II double their chances of earning a bachelor's degree.³
- College students who took Algebra II or beyond during high school are more than twice as likely to report feeling prepared for the math they are expected to do in college.⁴ They also perform significantly better in a range of college courses, including physics, chemistry and even biology.⁵

Advanced math equals career opportunity.

- Growth in math-intensive science and engineering jobs is outpacing overall job growth by three to one.⁶
- Through 2016, professional occupations are expected to add more new jobs—at least five million—than any other sector and within that category computer and mathematical occupations will grow the fastest.⁷
- Simply taking advanced math has a direct impact on future earnings, apart from any other factors. Students who take advanced math have higher incomes ten years after graduating—regardless of family background, grades and college degrees.⁸
- Even so-called “blue collar” jobs now require advanced math: One study found that the math skills required by electricians, construction workers, upholsterers and plumbers now match what's necessary to do well in college courses.⁹ The International Brotherhood of Electrical Workers recently created a test for prospective apprentices that includes algebra problems.¹⁰
- Among high school graduates who enter the job market, 68 percent of those who took Algebra II or higher feel prepared for the math they are expected to do at work, compared with only 46 percent of their peers. Nearly half regretted not taking more challenging math courses in high school.¹¹


$$[X_i - \bar{X}]^2 \partial^2 \Omega$$

Advanced math equals a stronger economy.

- Economists say that if the U.S. could improve math and science achievement so that its students become globally competitive, America's gross domestic product could eventually grow by an additional 36 percent.¹²
- Advanced math can help spread economic opportunity, too: Inequities in advanced math course-taking account for one-quarter of the income gap between students from low-income and middle-class families ten years after graduation.¹³

ENDNOTES

- 1 Roderick, M. (2006, April). *Closing the Aspirations-Attainment Gap: Implications for High School Reform*. New York: MDRC. (p. 3)
- 2 Dohm, A. & Shniper, L. (2007, November). *Employment outlook: 2006-16*. Washington, DC: Bureau of Labor Statistics. (p. 90)
- 3 Adelman, C. (2006, February). *The Toolbox Revisited: Paths to Degree Completion from High School through College*. Washington, DC: U.S. Department of Education.
- 4 Peter D. Hart Research Associates/Public Opinion Strategies. (2005). *Rising to the Challenge: Are High School Graduates Prepared for College and Work?* Washington, DC: Achieve, Inc.
- 5 Sadler, P. M. & Tai, R. H. (2007). The two high-school pillars supporting college science. *Science*, 317, 457-8.
- 6 National Science Board cited in U.S. Department of Education. (2008). *The Final Report of the National Mathematics Advisory Panel*. Washington, DC: Author. (p. xii)
- 7 Dohm, A. & Shniper, L. (2007, November). *Employment outlook: 2006-16*. Washington, DC: Bureau of Labor Statistics. (p. 89)
- 8 Rose, H. & Betts, J. R. (2004, May). The effect of high school courses on earnings. *The Review of Economics and Statistics*, 86(2), 497-513.
- 9 ACT, Inc. (2006). *Ready for College or Ready for Work: Same or Different?* Iowa City, IA: Author.
- 10 National Joint Apprenticeship and Training Committee for the Electrical Construction and Maintenance Industry, <http://www.njatc.org/training/apprenticeship/index.aspx>.
- 11 Peter D. Hart Research Associates/Public Opinion Strategies. (2005). *Rising to the Challenge: Are High School Graduates Prepared for College and Work?* Washington, DC: Achieve, Inc.
- 12 Hanushek, E. A., Jamison, D. T., Jamison, E. A., & Woessmann, L. (2008, spring). Education and economic growth. *Education Next*, 8(2), 62-70.
- 13 Rose, H. & Betts, J. R. (2004, May). The effect of high school courses on earnings. *The Review of Economics and Statistics*, 86(2), 497-513. (p. 510)


$$\sqrt{b^2}$$
$$x - \mu$$